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ABSTRACT

Volume 1, numbers 3 and 4, of the newsletter on the use of non-Western languages with computers contains the following articles: "Reversing the Screen under MS/PC-DOS" (Dan Brink); "Comments on Diacritics Using Wordstar, etc. and CP/M Software for Non-Western Languages" (Michael Broschat); "Carving Tibetan in Silicon: A Tibetan Font for the Mackintosh" (John Rockwell, Jr.); and "Notes on the Kanji Mackintosh" (Anthony Meadow). Other features include reviews of organizations, books, journals and magazines, and articles; hardware and software product listings; inquiries; event listings; and news within the field. (MSE)

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The primary information source about using non-Western languages with computers

Volume 1, Numbers 3 & 4 September, 1986

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Editor, Newsletter for Asian and Middle Eastern Languages on Computer
Bear River Systems
PO Box 1021
Berkeley, CA 94704
USA

Electronic submission of articles is encouraged. Please contact the editor regarding this.

Editor's Page

Welcome to the last issue of volume 1 of the **Newsletter for Asian and Middle Eastern Languages on Computer**. In this combined issue (numbers 3 and 4), we have four articles. The first article, by Dan Brink, describes how to make the IBM PC properly handle right-to-left languages. As part of the article, the source code for a small program to do just that is given. Next, Michael Broschat continues the discussion of diacritics in various word processing programs and then goes on to discuss additional topics. John Rockwell, Jr. describes his Tibetan font for the Macintosh and describes how it was developed. Finally, I wrote up notes from a talk given by the staff at Apple Computer who developed the Japanese version of the Macintosh.

I apologize to everyone for the long delay in getting the Newsletter out. Since this issue is almost a year late, we will begin Volume 2 in early 1987. I have decided that I will put out an issue every three months, whether there are sufficient articles or not. This may mean that one or more issues will be quite slim, but I do want the Newsletter to come out more regularly.

If you have an article you'd like to write, please call or write. We will have software that needs to be reviewed – if you'd like to do it, again please contact me.

The subscription rates have been raised to ensure that this Newsletter can continue. The new rates are $12 per year for individuals and $18 per year for institutions. There is a $5 surcharge if you require an invoice. As always, these rates apply to the entire world. American subscribers therefore end up subsidizing those in the rest of the world, since it costs more than $15 to airmail the newsletter to Europe for a year (and even more to Asia). That doesn't include the additional costs of printing, envelopes, and so on.

Once again, a number of people greatly helped in getting this issue of the Newsletter out. I would like to thank Barbara Guerlin, Eric Crystal, and Bruce Pray of the Center for South and Southeast Asian Studies at the University of California. George Hart of the Department of South and Southeast Asian Studies at UC Berkeley has been very helpful in many ways, including sharing ideas and equipment, such as the LaserWriter that this newsletter was printed on. Lastly, I would like to thank my wife Diana for all her assistance in all aspects of publishing this newsletter. This newsletter would have been even later without her.

This newsletter was written with Microsoft Word and MacWrite on a Macintosh and printed on an Apple LaserWriter. It was then reproduced on a large photocopying machine.

Anthony Meadow
Editor

Reversing the Screen under MS/PC-DOS

Dan Brink
English Department
Arizona State University

The program described in this article, REVERSE.COM, reverses the SCREEN IMAGE of the direction of letter flow from left-right to right-left on microcomputers using the MS/PC-DOS operating system. This program allows scholars to use a number of off-the-shelf word processing systems for more natural text editing in languages with a right-left letter flow. The system works with versions 1.0 through 3.0 of Microsoft DOS; it does not work with word processors which use direct-screen machine code (such as WordStar 3.3). If you use an IBM PC-compatible micro and a very *conservative* word processor (such as EDLIN or WordStar 3.24), REVERSE.COM will greatly simplify the process of "reverse editing."

REVERSE.COM is not intended as a competitor for a state-of-the-art Semitic word processor. It does not generate non-Roman characters; nor does it change the sequence of characters in the text file: it is assumed that character-set problems are taken care of by a custom or programmable character generator and that print direction is controlled by ESC commands (see below). Neither does it provide for left-right and right-left editing on the same line; REVERSE.COM is simply an inexpensive way of doing basic word processing in right-left languages.

The general idea of REVERSE.COM is to interrupt the monitor routines of DOS, determine where the cursor is about to be placed, and shift it to the equivalent position calculated from the opposite side of the screen. This strategy is found in its simplest form in lines 13D-143 of the listing. (For an explanation of how to interrupt the monitor routines, see my "Display Character Set Customization" in **PC Tech Journal** 1 (July, 1983), pp. 121-29.)

When REVERSE.COM is first loaded, it is in mode #1, the NO-reverse mode. To shift to one of the active modes, one simply types "&": the first occurrence of this symbol shifts REVERSE.COM into mode #2, DOS-reverse; the next "&" moves it to mode #3, WP-reverse. Yet another "&" returns the system to the original, NO-reverse mode, beginning the cycle again. (It is important to remember and appreciate the effect of the "&": the occurrence of this symbol in a text can result in a constantly flipping screen when REVERSE.COM has been loaded, because each time that "&" is repositioned on the screen by your word processor, it sends REVERSE into the next mode. An ampersand entered from within a word processor to shift modes should be erased immediately thereafter. Another symbol can be used instead of the ampersand, by the way; simply replace the 26 hex in line 106 with the ASCII value of your choice.

There are two active modes in REVERSE.COM because there are (at least) two approaches to controlling screen position in commercial word processers. In the first of these, used, for example, in EDLIN, depends on the DOS TTY function to move the cursor, the same function which handles cursor movement in DOS itself, in DEBUG, and in some very simple, "plain vanilla" word processors. It is characteristic of these programs that the current cursor position is used to determine the new cursor position. When reversing the screen under these conditions, REVERSE.COM must keep an internal tally of cursor position and, in effect, build its own TTY routine (lines 147-178).

In the second approach to handling the cursor, the word processor ignores the current cursor position and calculates every move internally. When such a program is active, the screen can be reversed by the simple strategy found in lines 13D-143, as already described.

When first activated, REVERSE.COM is in mode #1 and has no obvious effect on the monitor. Then, when an ampersand is typed activating mode #2, the screen will be reversed if you are still in DOS or a 'plain vanilla' word processor like EDLIN. (WARNING: If a second "&" is typed while still in DOS or a 'plain vanilla' word processor, the result is an unreadable screen, usually a vertical character stream on the extreme right. This condition can be corrected by typing yet another "&," which shifts REVERSE.COM back to mode #1.)

Similarly, if you intend to use a position-controlling word processor, you should enter a second "&" command to move to mode #3 just before entering your word processor. (If you enter the command after loading your editor, be sure to erase it immediately, to prevent spontaneous "flipping.")

Thus, there are a number of possible effects for REVERSE.COM. Since every word processor has its own idiosyncracies, you should try REVERSE.COM in all modes with YOUR word processor to determine whether it will work for you. There are, of course, many word processors which handle cursor positioning in ways not compatible with REVERSE.COM in either mode. You will have to experiment. REVERSE.COM also has no effect on word processors which write directly to the screen, such as WordStar 3.3. (It works fine with WordStar 3.24).

REVERSE.COM has no effect on the windows of programs such as Borland's SideKick.

The REVERSE.COM listing presents both ASM and machine code,with annotations. If you compile the ASM version, it must be converted from EXE to COM format in the normal way. If you plan to enter the machine code using DEBUG, begin editing at 100h, and set CX to 140h before writing to disk. For those with no background in assembler, I will gladly copy the program, if you provide a diskette and a stamped, self-addressed diskette mailer. And, there are no guarantees.

REVERSE.COM will be of little use if you do not have a printer which can shift into right-left mode. If you have such a printer, such as the Diablo 630, or the Fujitsu model I, simply put the required ESC code at the beginning of the text file. If you are working in Arabic, or some other language with shifting character shapes, you will most likely need a dot matrix printer and special software. A number of programs were listed in the last issue of the *Newsletter*.

As far as non-Roman character sets are concerned, it is necessary for the IBM family to use a graphics board or a custom character generator. The possibilities break down into five general categories:

1) use the IBM graphics board: this board has such low resolution as to be generally unsatisfactory in most cases; moreover, there are so many compatibility problems in graphics mode that the likelihood of success with any given word processing package is very small;

2) use the IBM enhanced graphics board: this board has far better resolution, but the compatibility problems remain, and the board is relatively expensive;

3) use someone else's graphics board, especially the Hercules board; this is a common solution, and many high-performance word processing systems have been written to such boards;

4) use a permanent, custom character generator ("burn a PROM"): if you know you are going to dedicate your machine to a specific non-Roman text processing function, this is a reasonable alternative. However, getting the PROMs can be difficult; the best ones are usually developed by the makers of high-performance word processors, who will not sell them without the purchase of the entire package;

5) buy a programmable character generator, such as MULTIFONT or XENOTECHNIX; these systems generally have neither the compatibility sensitive of graphics boards, nor the permanence problems of PROMs. Both the systems mentioned work with the IBM high resolution monochrome card and monitor, and are relatively inexpensive.

The source code for REVERSE.ASM and the assembly listing follow.

The author can be contacted by writing to: Dan Brink, Dept. of English, Arizona State University, Tempe, AZ 85287.

Source Code for Reverse.Asm (for MS/PC-DOS Machines)

```
                ;REVERSE.ASM
INT_10 EQU 0040H        ;by Dan Brink
CSEG SEGMENT            ;English
ORG 100H          ;ASU
ASSUME CS:CSEG,DS:CSEG ;Tempe, AZ
     JMP INIT     ;85287
     DB 1AH               ;
     DB 2 DUP(0) ;
ESC  DB "&"               ;edit ESC!
     DB 2 DUP(0) ;
WDTH DB 4FH               ;edit WDTH!
     DB 2 DUP(0) ;
ON   DB 0          ;not active
     DB 2 DUP(0) ;
COL  DB ?          ;set by INIT
     DB 0          ;screen top
STRT:      CMP AH,2     ;cursor set?
     JNZ OVER     ;if no, skip
     CMP AL,CS:ESC      ;change mode?
     JNZ ON_CHK   ;
     PUSH AX      ;if so, reset
     MOV AL,CS:ON       ;  by adding
     INC AL             ;  1 to ON
     CMP AL,3     ;  but if 3
     JNZ SET_ON   ;  then
     SUB AL,AL    ;  set to 0
SET_ON: MOV CS:ON,AL   ;store mode
     POP AX             ;
     JMP SHORT OVER     ;done
ON_CHK: PUSH AX  ;
     MOV AL,CS:ON       ;
     CMP AL,1     ;get mode
     POP AX             ;
     JL OVER      ;if 0, NO flip
     JZ TALLY     ;if 1, DOS flip
     MOV AL,CS:WDTH     ;WP reverse:
     SUB AL,DL    ;  DL from 80
     MOV DL,AL    ;  result to DL
     JMP SHORT OVER     ;
TALLY:     CMP AL,8     ;BS?
     JNZ NORMAL   ;
     MOV DL,CS:COL      ;if so, INC DL
     CMP DL,CS:WDTH     ;   but not
     JZ BLANK     ;   past 80
     INC DL             ;
     MOV CS:COL,DL      ;
BLANK:     MOV AL,20H   ;blank to AL
     JMP SHORT OVER     ;
NORMAL: CMP DL,0 ;row to 0?
     JNZ SHFT_C   ;
     MOV DL,CS:WDTH     ;if so, set 80
SAVE:      MOV WORD PTR CS:COL,DX
SHFT_C: CALL SET_COL   ;
OVER:      DB 0EAH      ;far jump
```

```
REV_OFF DW ?            ;offset addr
REV_SEG DW ?            ;segment addr
                ;
SET_COL PROC NEAR       ;
     MOV DL,CS:COL      ;adjust COL
     OR DL,DL     ;if DL 0
     JNZ DEC_DL   ;reset to
       MOV DL,CS:WDTH  ;  width
     CMP DH,24    ;if DH
     JZ DEC_DL    ;at bottom
     INC DH             ;adjust HT
     MOV CS:COL+1,DH    ;and store
DEC_DL:    DEC DL              ;move left
     MOV CS:COL,DL      ;and store
     RET           ;
SET_COL ENDP            ;
                ;
INIT:       PUSH DS     ;set stack
     SUB AX,AX    ;   for ret
     PUSH AX      ;
     MOV DS,AX    ;DS to ABSO
     MOV AX,OFFSET STRT
       CMP DS:INT_10,AX ;  loaded?
     JNZ LOAD     ;if not, go on
     CALL SIGN_ON       ;print instr
     INT 20H      ;quit
LOAD:       MOV AL,CS:WDTH    ;
     MOV CS:COL,AL      ;set COL
     MOV AX,DS:INT_10
     MOV CS:REV_OFF,AX
     MOV AX,DS:INT_10+2
     MOV CS:REV_SEG,AX
     MOV AX,OFFSET STRT
     MOV DS:INT_10,AX
     MOV AX,CS    ;
     MOV DS:INT_10+2,AX
     CALL SIGN_ON       ;print instr
     MOV DX,OFFSET INIT
     INT 27H      ;resident!
SIGN_ON PROC NEAR       ;
     PUSH CS      ;
     POP DS             ;
     MOV DX,OFFSET MESS
     MOV AH,9     ;DOS print
     INT 21H      ;
     RET          ;
SIGN_ON ENDP            ;
MESS        DB 0AH,"Ampersand is Esc chr: "
     DB "NO-reverse:DOS-reverse:WP-reverse"
     DB 0DH,0AH,"$"     ;
CSEG ENDS           ;
END                 ;
```

Assembly Listing for Reverse.Asm (for MS/PC-DOS Machines)

```
The IBM Personal Computer MACRO Assembler 01-01-80      PAGE  1-1


                                        ;REVERSE.ASM
= 0040                          INT_10 EQU 0040H  ;by Dan Brink
0000                            CSEG SEGMENT            ;English
0100                            ORG 100H          ;ASU
                              ASSUME CS:CSEG,DS:CSEG  ;Tempe, AZ
0100  E9 019B R                       JMP INIT    ;85287
0103  1A                              DB 1AH            ;
0104     02 [0]                       DB 2 DUP(0) ;
0106  26                        ESC   DB "&"            ;edit ESC!
0107     02 [0]                       DB 2 DUP(0) ;
0109  4F                        WDTH  DB 4FH            ;edit WDTH!
010A     02 [0]                       DB 2 DUP(0) ;
010C  00                        ON    DB 0        ;not active
010D     02 [0]                       DB 2 DUP(0) ;
010F  ??                        COL   DB ?        ;set by INIT
0110  00                              DB 0        ;screen top
0111  80 FC 02                       STRT: CMP AH,2    ;cursor set?
0114  75 5E                           JNZ OVER    ;if no, skip
0116  2E: 3A 06 0106 R                     CMP AL,CS:ESC     ;change mode?
011B  75 14                           JNZ ON_CHK  ;
011D  50                              PUSH AX           ;if so, reset
011E  2E: A0 010C R                   MOV AL,CS:ON      ;  by adding
0122  FE C0                           INC AL            ;  1 to ON
0124  3C 03                           CMP AL,3    ;  but if 3
0126  75 02                           JNZ SET_ON  ;  then
0128  2A C0                           SUB AL,AL   ;  set to 0
012A  2E: A2 010C R             SET_ON: MOV CS:ON,AL  ;store mode
012E  58                              POP AX            ;
012F  EB 43                           JMP SHORT OVER    ;done
0131  50                        ON_CHK:     PUSH AX           ;
0132  2E: A0 010C R                   MOV AL,CS:ON      ;
0136  3C 01                           CMP AL,1    ;get mode
0138  58                              POP AX            ;
0139  7C 39                           JL OVER           ;if 0, NO flip
013B  74 0A                           JZ TALLY    ;if 1, DOS flip
013D  2E: A0 0109 R             MOV AL,CS:WDTH    ;WP reverse:
0141  2A C2                           SUB AL,DL   ;  DL from 80
0143  8A D0                           MOV DL,AL   ;  result to DL
0145  EB 2D                           JMP SHORT OVER    ;
0147  3C 08                     TALLY:      CMP AL,8    ;BS?
0149  75 17                           JNZ NORMAL  ;
014B  2E: 8A 16 010F R                 MOV DL,CS:COL    ;if so, INC DL
0150  2E: 3A 16 0109 R                 CMP DL,CS:WDTH   ;   but not
0155  74 07                           JZ BLANK    ;   past 80
0157  FE C2                           INC DL            ;
0159  2E: 88 16 010F R                      MOV CS:COL,DL     ;
015E  B0 20                     BLANK:      MOV AL,20H  ;blank to AL
0160  EB 12                           JMP SHORT OVER    ;
0162  80 FA 00                  NORMAL: CMP DL,0  ;row to 0?
0165  75 0A                           JNZ SHFT_C  ;
0167  2E: 8A 16 0109 R                MOV DL,CS:WDTH    ;if so, set 80
016C  2E: 89 16 010F R                SAVE:       MOV WORD PTR CS:COL,DX
```

```
0171  E8 0179 R          SHFT_C: CALL SET_COL    ;
0174  EA                 OVER: DB 0EAH           ;far jump
0175  ????               REV_OFF DW ?            ;offset addr
0177  ????               REV_SEG DW ?            ;segment addr


The IBM Personal Computer MACRO Assembler 01-01-80      PAGE  1-2
                                ;
0179                     SET_COL PROC NEAR ;
0179  2E: 8A 16 010F R                MOV DL,CS:COL     ;adjust COL
017E  0A D2                    OR DL,DL    ;if DL 0
0180  75 11                   JNZ DEC_DL  ;reset to
0182  2E: 8A 16 0109 R                MOV DL,CS:WDTH ;  width
0187  80 FE 18                 CMP DH,24   ;if DH
018A  74 07                    JZ DEC_DL   ;at bottom
018C  FE C6                    INC DH            ;adjust HT
018E  2E: 88 36 0110 R                MOV CS:COL+1,DH ;and store
0193  FE CA              DEC_DL:       DEC DL            ;move left
0195  2E: 88 16 010F R                MOV CS:COL,DL     ;and store
019A  C3                       RET          ;
019B                     SET_COL ENDP            ;
                                ;
019B  1E                 INIT:         PUSH DS       ;set stack
019C  2B C0                    SUB AX,AX   ;   for ret
019E  50                       PUSH AX           ;
019F  8E D8                    MOV DS,AX   ;DS to ABSO
01A1  B8 0111 R                MOV AX,OFFSET STRT
01A4  39 06 0040                 CMP DS:INT_10,AX ;  loaded?
01A8  75 05                    JNZ LOAD    ;if not, go on
01AA  E8 01D8 R                CALL SIGN_ON      ;print instr
01AD  CD 20                    INT 20H           ;quit
01AF  2E: A0 0109 R      LOAD: MOV AL,CS:WDTH    ;
01B3  2E: A2 010F R            MOV CS:COL,AL     ;set COL
01B7  A1 0040                  MOV AX,DS:INT_10
01BA  2E: A3 0175 R            MOV CS:REV_OFF,AX
01BE  A1 0042                  MOV AX,DS:INT_10+2
01C1  2E: A3 0177 R            MOV CS:REV_SEG,AX
01C5  B8 0111 R                MOV AX,OFFSET STRT
01C8  A3 0040                  MOV DS:INT_10,AX
01CB  8C C8                    MOV AX,CS   ;
01CD  A3 0042                  MOV DS:INT_10+2,AX
01D0  E8 01D8 R                CALL SIGN_ON      ;print instr
01D3  BA 019B R                MOV DX,OFFSET INIT
01D6  CD 27                    INT 27H           ;resident!
01D8                     SIGN_ON PROC NEAR ;
01D8  0E                       PUSH CS           ;
01D9  1F                       POP DS            ;
01DA  BA 01E2 R                MOV DX,OFFSET MESS
01DD  B4 09                    MOV AH,9    ;DOS print
01DF  CD 21                    INT 21H           ;
01E1  C3                       RET          ;
01E2                     SIGN_ON ENDP            ;
01E2  0A 41 6D 70 65 72  MESS        DB 0AH,"Ampersand is Esc chr: "
      73 61 6E 64 20 69
      73 20 45 73 63 20
      63 68 72 3A 20
01F9  4E 4F 2D 72 65 76    DB "NO-reverse:DOS-reverse:WP-reverse"
      65 72 73 65 3A 4
```

```
01B3  2E: A2 010F R           MOV CS:COL,AL     ;set COL
01B7  A1 0040                 MOV AX,DS:I4
      4F 53 2D 72 65 76
      65 72 73 65 3A 57
      50 2D 72 65 76 65
      72 73 65
021A  0D 0A 24                      DB 0DH,0AH,"$" ;
021D                    CSEG ENDS         ;
                    END               ;
```

Comments on Diacritics using Wordstar, etc. and CP/M Software for Non-Western Languages

Michael Broschat
Seattle, WA

The recent issue with articles by Jay Rubin and George Hart reminded me that not all problems with putting foreign languages on computers have the complexities of the Chinese problem, the only one I have any real interest in. I was reminded also that in both issues authors have addressed problems with doing something "foreign" on *existing* equipment.

The problems of making a Chinese-English word processing computer are apparently so complex that other than "ordinary" computers will be necessary to accomplish the task. I am not saying that solutions do not already exist, nor that they have not been implemented on computers like the IBM PC, but that said solutions are being sold at prices beyond the realm of "personal" computers and that those solutions are not necessarily ideal, and are certainly not *standard.* Y.R. Chao once wrote that the problem of what romanization system should be used for transliterating Chinese would only be solved when the Chinese themselves agreed on a standard. For better or worse, we thus have the so called Pinyin system from mainland China. I think that the same situation is true for computerizing Chinese. The "true" solution will come when China agrees on a standard for coding and for input. For all I know, this may already have happened. At any rate, news of that event and its consequences has not reached me, and I will continue to maintain that the "final" solution to computerized Chinese will depend upon actions of the People's Republic of China.

In the meantime, some of us got into computers long enough ago that when we bought one for ourselves the standard of the time was running the CP/M operating system. This is just fine for most word processing, but its lack of a graphics standard left it no future when it came to generating non-Roman alphabets, etc. Sure, it can be done. I could do it, you could do it, Ralph could do it, but none of our solutions would be likely to have much in common with each other.

But a lot of things have been done with CP/M machines by the hackers who cut their eye teeth on them. For the generation of *printed* non-Roman characters, much can be done using existing or slightly modified software. Should there be anyone out there who has CP/M equipment and has needs that are less complex than those of my interest (the Chinese-English word processing mentioned above), the following discoveries might be of use.

Most significant software for CP/M of which I am aware is called "public domain," that is, software written for the free non-commercial use of operators of CP/M based computers. Before I pass on some information about relevant items from that world, I think that everyone should know of a product I have not seen mentioned in the pages of the *Newsletter*, namely, *FancyFont* by SoftCraft, Inc., 222 State St., Madison WI 53703. This $180 (list) piece of software is available for both CP/M and MS/PC-DOS operating systems, and works in conjunction with either the Epson series of printers or certain other dot matrix printers to literally draw letters, characters, or whatever, using the printer's graphics features. Where this would meet certain needs for readers of this publication is in its ability to allow redefinition of any font set or character within that set. You could call up any font set and redefine each letter (or whatever) in it to correspond to symbols in Indian languages or Japanese hiragana/katakana or just about anything else you could think of. The latest version increases the resolution over the earliest release, which is still good enough for many purposes. The only failing I can see (for purposes of concern to us here) is that like the

Macintosh printing system, everything you do has to be in the "graphics" mode. In other words, you cannot just print the way you usually do, using the fonts that are part of your printer (and therefore *fast*), and then call in one of these special fonts at will. Your entire document must be drawn by the software using dots. For my taste, this creates results that are just too fancy for a lot of things. But the potentials for producing "publishable" documents are marvelous, and really do give ordinary CP/M (or MS/DOS) machines some of the graphics capabilities of a Macintosh, although without any screen abilities, of course.

For my current work as a translator of Chinese technical documents, I have been using a slightly modified WordStar, one or two features of which could be of use to others. The particular program of which I write is called FXDRVR, although the copyright message says "Special Graphics Driver," by Paul Gans (my version, 3.1b February 1985). This program actually runs WordStar under itself. It intercepts certain printing features and substitutes its own routines, but, as written, only for an Epson FX-80 printer. For my use, FXDRVR has the code for a downloadable alternate character set that provides scientific and math symbols in any text, almost transparently. All you do is consult your chart, type ^P^Q and then the key corresponding to the symbol you want, and when the document is printed, there it is. An alternate set could be devised that had other than Roman symbols. Surely, Jay Rubin's macron over certain letters problem would be a cinch for this program. A letter in the alternate character set, say an 'a'could be defined as a macron over 'a'. When you needed this special letter while using WordStar, you would just type ^P^Q and then an 'a'. The ^P^Q would tell FXDRVR that the next character was to be printed from the alternate character set. Since control characters do not take up space in WordStar (even though they appear on the screen), formatting will not be affected by use of FXDRVR.

There are public domain character editors that work like that of FancyFont, where one character fills the screen, each area to be printed being represented by asterisks. You rearrange the asterisks, the program shrinks the whole screen size down to the space of one character position, and off you go. These character editors are not supplied with FXDRVR, but are mentioned by its author. Source code for FXDRVR is supplied (Z80 assembly language), so modification is possible. Contact your local public domain software source or drop me a note.

Doug Hurst wrote a program called ANYCODE that allows WordStar to directly input any printer codes you like to your printer. The possibilities for this exceed those of FXDRVR, but the hitch is that the code is sent in batches of numbers, corresponding to the hexadecimal code that you are sending. To give an example, I have my copy of WordStar modified so that when I type ^P^E, WordStar automatically sends the code to the printer to switch to the enlarged type font. ANYCODE would require the string "~45", and other instructions could be much longer. So what? They don't show up in your text. True, but they take up real space both on the screen and in WordStar's formatting accounting. It doesn't know that these codes aren't text.

Nevertheless, having access to any possible printer codes is very nice indeed, and ANYCODE could be of special use with MailMerge, where single symbols could stand for groups of codes, those groups to be substituted for the single symbols automatically by MailMerge when the file is being printed. Haven't tried this myself, but have heard of others doing it. ANYCODE is supplied in 8080 form, to be assembled and patched into WordStar as a .HEX file.

Ernest Bergmann's ROFF4 is an excellent text formatter that has great possibilities for the kind of things in which we are interested. You can use any editor to create text. Its formatting controls are just regular screen characters, interpreted in special ways. In other words, you never see on the screen what your stuff looks like (unless you are viewing a file that has already been formatted) but you have a great deal of control over how things come out. One of the main reasons Bergmann designed this program was to be able to print out scientific papers (he is a physicist). For our purposes, his definitions of scientific and mathematical symbols could be replaced with definitions for "strange" figures and characters.

ROFF4 was written in BDS C, and I understand there are ways to translate that dialect of C into MS/PC-DOS types of C. If so, this program could presumably be provided for users of said equipment. A note to Professor Bergmann might not be a bad idea for anyone so interested. He can be reached at: Physics, Building #16, Lehigh University, Bethlehem PA 18015 , or by telephone at (215)861-3932. The program is distributed through SIG/M, or drop me a line.

One other program of possible interest to many is TEX. [Editor's note: for more information on the TEX system, refer to the two previous issues of this newsletter.] Many of you might know TEX as a heavy duty formatting program for publication quality scientific and especially mathematics text. It is usually used with a laser printer, but in the new IBM PC (and other MS/DOS?) format TEX will also work with an Epson FX80, and probably others. The real advantage to having TEX on a microcomputer is that you can do all the formatting work yourself, including proof printing on your cheap printer, and then send the completed file to some facility (commonly at universities, but some commercial enterprises, too) for "real" printing. I have seen Chinese characters done for TEX (with METAFONT) and heard that some Indian languages have been done for it as well, but don't know much more about it. There is a review of the IBM PC implementations of TEX in the September/October 85 issue of Micro/Systems Journal, with details on its availability. It runs about $250. If you are curious and somewhere near a large (?) university, find someone there who knows about TEX and ask whether it would be of any use to those who wish to print foreign languages.

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Carving Tibetan in Silicon: A Tibetan Font for the Macintosh

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Why put Tibetan on a computer in the first place? Can it help in reciting mantras and visualizing seed syllables? Most likely not, but those who have discovered the joys of word processing on a computer know that its main virtue lies in its ability to continually revise the written word. My own inspiration for attempting such an esoteric project originated from working on a Classical Tibetan Primer for use at Naropa Institute. In order to avoid the laborious process of writing and rewriting out by hand all the Tibetan examples, exercises, and glossaries, I began looking at computers and word processing programs to see if any could be taught Tibetan.

The first computer that caught my eye was the Macintosh by Apple Computer. What intrigued me most was the Macintosh's ability to design and use different fonts or typefaces within a single word processing program. It was virtually effortless to switch back and forth between different fonts, even on the same line. Though, at the time, I had little idea how I would teach it Tibetan, I plunged ahead and purchased a Macintosh with the intention of creating and installing a Tibetan font in a word processing program. Everybody said that it was indeed possible, but no one knew exactly how to do it.

The true difficulty of adapting the Tibetan language to both the typewriter and the computer is the fact that most words have stacks of several letters as one unit. For example, in the Tibetan word "rgyu," the first three consonants "r-g-y" are written one on top of the other as one unit – ཀྱ – and the vowel "u" is written underneath this unit as ཀྱུ.

The typewriter gets around this problem by have one key for "rg," i.e. ཀ, one key for "y," i.e. ྱ, and one key for "u," i.e. ུ. Then to type the word "rgyu," one must hit the key for "rg," backspace, hit the key for "y," backspace, and finally hit the key for "u." This is obviously not condusive to Tibetan speed typing.

Fortunately, the total possible number of these stacked consonant combinations in Tibetan is rather limited. There are 72 basic combinations, in addition to the 30 main consonants, the 4 vowels, and the 2 most basic punctuation marks, making a total of 108 to start with. This sounds like a lot, but in one Macintosh font file one can design up to 255 characters. Essentially, this is equivalent to having four different keyboards in front of one, or a typewriter with four different kinds of shift keys.

So, instead of using the typewriter approach of adding the consonants together, piece by piece, and wearing out the backspace key, I designed one key for each possible combination of stacked consonants. For example, for the Tibetan word "rgyu," instead of typing the three letters r-g-y, one simply types the one key for "rgy." The vowels are then added on separate lines above and below the line of consonants. Obviously, this does not lead to speed typing either. This system takes a while to get used to, as one has the learn the location of all these combinations on the various keyboards, but my experience so far is that this is not as difficult as it sounds. At this point I can touch type the consonants fairly rapidly without looking at my key chart very much.

All in all, there are two Tibetan font files. The first is called Tibetan 11/3 and the second is Tibetan 7/5. They differ in that the first font has eleven spaces above the so-called "baseline" of the letters and three spaces below the baseline. And the second font has seven spaces above the baseline and five below. In technical terminology, these are called the ascent and descent of a letter.

The main font that one uses is the 11/3 font. The best way that I've found to use it so far is to first type all the consonants for a given line, like so:

ཨདྷཀྵཁཀག་ཀས་པ་དས་ཀཅཀ་ཀ། བཅམ་ལྡན་འདས་རྒྱལ་པའི་ཁྲལ་བྱ་ཤེད་པའ་རྡ་ལ་

Then go to the beginning of the line above this line and write out all the top vowels for that line, like so:

འདི་སྐད་བདག་གིས་ཐོས་པ་དུས་གཅིག་ན། བཅོམ་ལྡན་འདས་རྒྱལ་པོ་ཁབ་ལྔ་ཐུ་རྣད་ཡང་པའ་རྡ་ལ་

Next push the whole row with the space bar and the pixel bar (this is the top left key that moves the letter one pixel instead of one space; it makes it possible to position the vowels exactly where you need them) till the first vowel reaches its appointed destination.

འདི་སྐད་བདག་གིས་ཐོས་པ་དུས་གཅིག་ན། བཅོམ་ལྡན་འདས་རྒྱལ་པོ་ཁབ་ལྔ་ཐུ་རྣད་ཡང་པའ་རྡ་ལ་

Then click in front of this vowel and push the remaining vowels to the next stop, and so forth.

འདི་སྐད་བདག་གིས་ཐོས་པ་དུས་གཅིག་ན། བཅོམ་ལྡན་འདས་རྒྱལ་པོ་ཁབ་ལྔ་ཐུ་རྣད་ཡང་པའ་རྡ་ལ་

Finally, go through this same process for the bottom vowels.

འདི་སྐད་བདག་གིས་ཐོས་པ་དུས་གཅིག་ན། བཅོམ་ལྡན་འདས་རྒྱལ་པོའི་ཁབ་ལྔ་ཐོད་ཡང་པོའི་རི་ལ་

འདི་སྐད་བདག་གིས་ཐོས་པ་དུས་གཅིག་ན། བཅོམ་ལྡན་འདས་རྒྱལ་པོའི་ཁབ་ལྔ་ཐོད་ཡང་པོའི་རི་ལ་

This font will appear slightly differently when you have English words on the same line as the Tibetan. Essentially, the vowels on top will be one pixel farther away from the consonants. This is because the English fonts are one pixel "taller" than the Tibetan one.

འདི་སྐད་བདག་གིས་ཐོས་པ་དུས་གཅིག་ན། Thus have I heard at one time.

The other font, Tibetan 7/5, is for when you need to write a Tibetan word within a paragraph of English words. It will push the lines a little further apart so that there will be space to handwrite the Tibetan vowels. For example:

Thus have I heard. Once the Blessed One was dwelling at Vulture Peak mountain in Rājagṛha together with a great saṅgha of monks and a great saṅgha of bodhisattvas. At that time the Blessed one entered the samādhi that expresses the dharma, called profound illumination.

Thus have I heard. Once the Blessed One was dwelling at Vulture Peak mountain in Rājagṛha together with a great དགེ་འདུན་ of དགེ་སློང་ and a great དགེ་འདུན་ of ཐུང་ཙུ་ལམས་དཔའ་. At that time the Blessed one entered the ཏིང་ངེ་འཛིན་ that expresses the dharma, called zབ་མོ་སྣང་བ་.

This inability to write a complete Tibetan word unless the lines above and/or below the consonants are clear is a minor but annoying shortcoming of this system.

Although typing on this computer system is slower and more cumbersome than computers on which one can just type the transliteration of the Tibetan and although it is presently not compatible with the IBM and related systems, there are several advantages that make it a definite plus overall. First of all, the computer software does not have to think to type these Tibetan letters, and so one immediately sees the Tibetan text on the screen as one types. Secondly, the letters look much better than those on most computers, due to the high-resolution screen and printing on the Macintosh. Thirdly and most importantly, with a little ingenuity, one can type Tibetan and English letters on the same line of text, as one can switch from Tibetan to English and back with ease. (The ingenuity comes in with the placing of the vowels.)

The true test of this Tibetan program didn't occur until a few weeks ago when Mark Wilding, a computer specialist and fellow Macintosh enthusiast, and I took a Macintosh to show to His Eminence Jamgön Kongtrül Rinpoche, while he was visiting in Boulder. After a few minutes of demonstration and instruction, His Eminence quickly got the hang of using the "mouse" pointer and the Tibetan font and immediately wrote on his own the following lines of verse from the liturgy "Fulfilling the Aspirations of Gyalwang Karmapa":

བཀྱ་ཤིས་དཔལ་འབར་འཇམ་གླིང་རྒྱན། མངའ་རིས་རྒྱལ་ཁམས་བོད་ཀྱི་ཡུལ།
ཁ་བ་ཅན་ཀྱི་བྱང་ཕྱོགས་སུ། ཚེས་ལྡན་བསྟུད་ཀྱི་བསྟན་པ་དར་བ་དང་།
འཇམ་གླིང་བདེ་བའི་བཀྱ་ཤིས་ཤོག འཇམ་པ་བདེ་བར་མཛད་དུ་གསོལ།

May the dharma teachings of the Practice Lineage,
The blazing glory of auspiciousness, the ornament of the world,
Flourish north of the kingdom of Tibet, the Land of Snow.
May there be auspicious peace throughout the world.
I supplicate you to bring peace to the world.

Thus was the potential of Tibetan word processing auspiciously blessed by a Tibetan tülku. Although this program and others like it are only crude beginnings, they provide the opportunity for other Tibetans and Westerners (scholars, translators, practitioners, and the like) to enter the realm of Tibetan word processing. Perhaps it would even be possible to persuade Apple Computer or an educational foundation to donate a Macintosh for the Tibetan school children at Rumtek in Sikkim, so that true Tibetan software could be eventually developed. Such a computer could also be connected by modem to Dharmanet or Indra Net (international electronic bulletin boards for those associated with or interested in the buddha dharma) to allow for Tibetan and English communication with other Buddhist and Tibetan communities around the world. In any event, these programs, limited though they be now, have many possible applications.

Anyone with a Macintosh who would like to use, play with, or in any way alter and/or improve this program is more than welcome.

[Editor's note: Mr. Rockwell's fonts are designed for use with English text in the Geneva font. Note also that there is another Tibetan font for the Macintosh described in this issue. Mr. Robillard's font is somewhat easier to use than Mr. Rockwell's.]

John Rockwell, Jr. is an Assistant Professor of Buddhist Studies at Naropa Institute. He is also a member of the Nalanda Translation Committee, which translates primarily Tibetan texts, and has worked on the publications The Rain of Wisdom and The Life of Marpa the Translator. Besides using his Macintosh for English and Tibetan word processing, he also uses MacPaint to design seals in Tibetan seal script.

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Notes on the Kanji Macintosh

Anthony Meadow
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Introduction

Mark Davis and another Apple employee gave a presentation on the Kanji Macintosh to the Macintosh Special Interest Group of the Software Entrepreneurs' Forum. The presentation was given on August 12th, 1986. This article outlines the information that came out of the presentation and from the questions asked afterwards. The Macintosh SIG is a large group of Macintosh developers (mostly from the San Francisco Bay area) that meets once a month. For more information about the group, contact the executive director, Barbara Cass, at 415/854-7219, or write to SEF, PO Box 61031, Palo Alto, CA 94306.

Features of the Kanji Macintosh

A Japanese version of the Macintosh has been developed by members of the technical staff of Apple Computer (including Mark Davis) in Cupertino in cooperation with the staff of Apple Japan. The machine runs in Japanese, i.e., all the menus, dialogs, etc. are in Japanese. At this time the product is available in Japan only, but a software-only version is available elsewhere (i.e. in the United States) and is called *Kanji Talk*. The first difference between the standard Macintoshes and the Japanese Macintosh is that the JIS-1 (the basic Japanese set of kanji characters) is built into a set of ROMs (Read Only Memories) in the Japanese version of the machine. Another difference is the Japanese keyboard, which has katakana and roman characters on the keycaps. Lastly, there are several new system software components, most of which are invisible to users.

Either version will allow any of the characters for Japanese to be used with most Macintosh application programs, although those programs which were not developed with "internationalization" in mind may have problems in word processing among other things. Standard text editing will always be properly handled. From informal reports I've received, KanjiTalk will work with Microsoft Excel but not Word. MacWrite can be used, but very carefully (especially with line boundaries – enter a return at the end of each line). In order to do word processing in Japanese at this time, it seems the best method is to use EgWord (see the product listings section for more details).

The JIS-1 set of characters, included as part of both versions of the product, is sufficient for about 82% of the characters used in everyday life. The addition of the JIS-2 set would be sufficient for about 95% of the characters used in everyday life. Each set consists of about 3000 characters. Specialized vocabularies, either technical, philosophical, historical, etc., are not included in the standard character sets. Plans for the future include the addition of the JIS-2 set of kanji characters.

The development work began in the middle of 1985, and required all the time of two software engineers. Some of the work was done by the staff of Apple Japan, a wholly owned subsidiary of Apple Computer. The product was released in Japan in May, 1986 and has attracted a great deal of attention because of certain features, especially a desk accessory that allows a user to define new kanji characters even in the middle of using another program. After creating a new kanji character using a font editor, the user enters the hirigana pronunciation for it. This capability is apparently

unique among all Japanese computer systems, for most systems require that new kanji characters be added in a special utility program that can be used only when outside of all other applications.

The character ROMs hold about 110 kilobytes of character bitmaps (for the JIS-1 16 point font). The software only version requires the same amount of memory, so it can only work on large Macintoshes (1 megabyte or more of RAM). A 1 megabyte Macintosh is recommended anyway, since the dictionary and conversion code take up a considerable amount of storage.

There are three kanji dictionaries that can be used at a time. The first is the system dictionary, which is always open and holds the JIS-1 character set. The second is a user dictionary and the third is a special dictionary. The rationale of having two other dictionaries is the following. The user dictionary adapts or 'learns' the typing characteristics of a particular user, and so gradually improves the accuracy of the hirigana-to-kanji conversion process. Specialty dictionaries can be created to hold other kanji characters of more specialized interest, e.g. medical, technical, or legal terms.

Some Technical Details of the Implementation

All the new system software was developed using the MDS assembly language development system; the kanji conversion software was first developed using Consulair C.

The rest of these notes in this section are an attempt to repeat the explanation that was given at the meeting. Even though this is fairly obscure, I felt that this was appropriate because it is unlikely that this will ever be repeated elsewhere. These notes require a good understanding of the Macintosh operating system.

The operating system has been modified so that it can work with the 16 bit (two byte) character codes that are used for the kanji characters. When a user types on the keyboard, the new software catches the keystrokes having previously patched in a new version of the GetOSEvent system call. A "translation" window is put up and the strokes are displayed in either hirigana, katakana or romanji, depending on the user's choice. The translation window is not a "ghost window", because the code to do the ghost window activation, deactivation and update was never correctly implemented by the standard Macintosh OS. When the user forces a conversion to kanji by pressing the Return key, the characters in the window are parsed grammatically and phonologically to produce a list of all possible kanji equivalents. The alternatives are displayed in best to worst order. The user then selects which kanji is correct. The conversion routines run as a separate application loaded above BufPtr.

After this, the characters are fed back to the application program using the PostEvent system call. The application program then receives the characters through the GetNextEvent system call.

There are modified TextEdit routines that replace the regular ones. The QuickDraw procedures StdText and StdTextMeasure were patched. These modified routines understand the existence of and what to do with 16 bit characters, and therefore do the correct things during text editing.

Concerns for Software Developers

Software developers have two major concerns in developing products that will work with Japanese, whether the product will be marketed solely in Japan or world-wide.

Firstly, the product should be completely "localizable," that is, the product should be easily moved to a European language. This means that all strings (of characters) should be resources, and should not appear in the code. This should include every character ever seen by the user. As an example of some of the subtlety involved, the Finder apparently had the ellipsis (...) hardcoded for use with the view by name and time options. This had to be moved into a resource so that it could be easily changed for Japanese and other languages. If a program is "localizable" for a European language, then it will probably be easy to localize to Japanese.

A related problem is that Japanese is generally not as concise as English. This affects menu titles, menu items, dialog items, help screens, and so on. Programs shouldn't depend on lengths of strings in any special way, such as filling up a help screen completely. The Japanese version will probably be longer.

Secondly, text editing is more complex because both 8 and 16 bit characters will be intermingled. Special guidelines are provided with the license for Kanji Talk to make this easier for developers. Applications must use special routines provided as part of the package when cutting, searching and replacing text to avoid cutting kanji characters in half. Standard TextEdit calls will always be handled correctly, but unmodified versions of more sophisticated text routines (e.g. CoreEdit) will have problems.

Ordering Information

The documentation for the product is primarily in Japanese, although there is some in English (especially the documentation for programmers).

The software only version of the product is available from Apple's Software Licensing Department. A licensing agreement must be signed before they'll let you have it, so if you're interested, write to: Software Licensing, Apple Computer, 20525 Mariani Avenue, MS 23F, Cupertino, CA 95014; or call them at 408/973-4667. The licensing fee is $50 (per year per product).

The Future

The Apple people also demonstrated an Arabic version of the Macintosh that automatically converted keystrokes to the appropriate form, depending on the characters' position in a word. It also went from right to left for Arabic letters, and from left to right for Arabic numerals and English. They also mentioned that a Chinese Macintosh was under development. No release dates were given (of course), but it is clear that Apple is working hard to make the Macintosh become THE international computer.

Reviews of Books, Journals, and Articles

Note that addresses are included for some publications which come from smaller or lesser known publishers. The editor has written everything in this section.

Organizations

A users group for **Chinese word processing systems** is being organized by Ernest Chin. The group was originally for users of the JHL China Star word processing program, but is now for users of any system that works with Chinese. Contact Ernest Chin at 415/493-4781 or write to Ernest Chin, 3387 Kipling Street, Palo Alto, CA 94306.

The **Dvorak International Federation** is an organization whose purpose is to promote the Dvorak keyboard. They can provide assistance to developers and manufacturers who want to implement this keyboard. It is not clear whether they can provide assistance for any languages beyond English. Membership is $20 per year. For more information, write to: Dvorak International Federation, Box 128, Brandon, VT 05773.

EgWord SIG, a user's group for EgWord, a Japanese word processor for Macintosh, was begun by Makiko Sato. The group meets regularly in the San Francisco Bay area, although interest from people in other areas is also very welcome. For more information, contact Makiko Sato at 415/321-8307 or by writing to 220 College Avenue #D, Palo Alto, CA 94306.

The **Word Processing Users' Group** is an international organization of word processing users. They publish a bimonthly newsletter called **Scroll**, which provides reviews of software, tutorials on using various word processing systems and so on. Dues are $15 per year. They can be reached at: W/PUG, Box 144, Malverne, NY 11565; telephone: 516/746-0056.

Books

Dakota State College has published **ICEBOL 85**, the proceedings of the 1985 international conference on English language and literature applications of SNOBOL and SPITBOL, held on May 30 to June 1, 1985 in Madison, South Dakota. Only one article is of direct interest, although anyone interested in the SNOBOL language will find other articles of interest. The article is "Northwest American Indian Language Data Processing with SNOBOL", by Timothy Montler, pp. 168-196. The Proceedings may be purchased from: Eric Johnson, 114 Beadle Hall, Dakota State College, Madison, SD 57042.

Ralph Griswold and Madge Griswold, **The Icon Programming Language**, Prentice–Hall, Englewood Cliffs, New Jersey, 1983 (ISBN 0-13-449777-5). This book introduces the **Icon** programming language. Ralph Griswold was one of the prime implementors of the SNOBOL programming language, one of the first languages that was designed to work with text and strings. Dr. Griswold took what lessons he could from SNOBOL and went on to develop a new language that was more modern in spirit. This became the Icon language. The book introduces the language in ten chapters, and then moves on to Icon's more advanced features such as generators, scanning and co–expressions. Several complete examples of Icon programs are included. Solutions are given to most of the exercises, so that the book can be used for self-study.

The Icon language has been placed in the public domain by Dr. Griswold. Icon is most commonly seen on Unix machines, but recently a version was made available for the IBM PC. An irregular newsletter is published about Icon. For information about obtaining Icon and the

newsletter, write to: Icon Project, Computer Science Department, The University of Arizona, Tucson, AZ 85721.

Susan Hockey, **Snobol Programming for the Humanities**, Clarendon Press, Oxford, 1985 (ISBN 0-19-824675-7). Susan Hockey has written an excellent modern introduction to the SNOBOL programming language, which is the most common language available for string and text processing. It is suitable for non-programmers learning SNOBOL as their first programming language as well as for those who have been programming for years. Exercises are given in each of the first nine chapters and solutions are given at the end of the book. The last chapters explain debugging techniques and possible uses for the language. SNOBOL has been available for a very wide range of machines, including microcomputers such as the IBM PC and compatibles.

The SNOBOL language has been placed in the public domain by one of it's implementors, Dr. Ralph Griswold. An irregular newsletter is published about SNOBOL. For information about obtaining SNOBOL and the newsletter, write to: SNOBOL Project, Computer Science Department, The University of Arizona, Tucson, AZ 85721.

Dario Lucarella, **Proceedings of the First European Conference on TEX for Scientific Documentation**, Addison-Wesley, Reading, Mass., 1985 (ISBN 0-201-13399-7). This is a collection of papers given at a conference held in Como, Italy on May 16 and 17, 1985. There are several papers of some interest:

S. Romberger and Y. Sundblad, "Adapting TEX to Non-English Languages that use Latin Alphabetic Chars", pp. 31-44.

J. Désarménien, "The Use of TEX in French: Hypenation and Typography", pp. 45-64.

W. Applet, "The Hyphenation of Non-English Words with TEX", pp. 65-70.

J. Li, "Generation of Some Chinese Characters with METAFONT", pp. 165-174.

There are more than a dozen other articles on TEX and METAFONT, a font designing program which is a component of TEX. The book is rather expensive (over $40). The entire book was produced with the TEX system.

J. Nievergelt, G. Coray, J.-D. Nicoud and A.C. Shaw, **Document Preparation Systems**, North-Holland Publishing Company, Amsterdam, 1982 (ISBN 0–444–86493–8). This is a collection of survey articles originally prepared for the Lausanne Conference on Research and Trends in Document Preparation Systems held in February, 1981. The articles in the book are:

"UNIX Document Preparation", Brian Kernighan and Michael Lesk

"Interactive Editing Systems", Norman Meyrowitz and Andries van Dam

"Document Formatting Systems", Richard Furuta, Jeffrey Scofield and Alan Shaw

"Choosing Better Line Breaks", Michael Plass and Donald Knuth

"Document Preparation Systems and Commercial Typesetting", John Seybold

"Errors in Dialog Design and How to Avoid Them", J. Nievergelt

Only the last two papers were written for this book. The others all appeared previously in journals, although most have been revised for this book. The article by Meyrowitz and van Dam and the article by Furuta, et al are especially interesting.

Middle East Economic Digest, Limited has recently published a marketing study entitled **Microcomputer Markets in the Middle East** (ISBN 0-946510-21-0). The study deals only with the Gulf countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates), Egypt and Jordan. This study reviews the following topics: the background and development of the hardware and software markets, attitudes to computing, market sizes and projections up to 1990, trade regulations and lists of the major users, suppliers and distributors. It is available for US$130 or UK£85. Contact: Book Sales Dept., MEED House, 21 John Street, London WC1N 2BP, United Kingdom. (Telephone: 01-404 5513).

Ching Y. Suen, **Computational Studies of the Most Frequent Chinese Words and Sounds**, World Scientific Publishing Co., Ltd., Farrer Road, PO Box 128, Singapore 9128

(ISBN 9971-50-022-1). 360 pages, US$52. This book presents the 6321 most commonly used Chinese words in two orderings: in descending order of frequency of use and in phonetic groups according to Suen's new phonetic system. A magnetic tape containing 4864 of these characters represented in a 50 by 50 matrix is also available (see the Software Product listings for details).

Xerox Corporation, **Character Set Standard**, XSIS 058404, April 1984. This is the current standard which Xerox Corporation uses internally for character set standards. It covers all the writing systems which Xerox's products can deal with. This includes English and most European languages, Greek, Cyrillic, Japanese (hirigana, katakana and kanji) and non-linguistic symbols. The document is well written and should be read by anyone contemplating the design of multi-lingual software, something that only Xerox has done well, although expensively. This document may be difficult to obtain.

CALTIS 83 is a collection of papers presented at the CALTIS-83 seminar held in Poona, India on January 29 through 31, 1983. This is the first of such annual conferences on CAlligraphy, Lettering and Typography of Indic Scripts. The papers vary widely in sophistication and usefulness, but there are sufficient papers of excellent quality that anyone with an interest in Indian scripts should find this quite interesting. Copies are available from the Institute of Typographical Research, 64 Budhwar Peth, Laxmi Road, Ganpati Chwok, Pune 411 002, India. The cost is Rs. 250 in India and US$50 elsewhere. Articles in this issue are:

Dr. Vishnu S. Wakankar, "Contribution of Inscriptional Writing to the Development of Typography".
R.K. Joshi, "Calligraphic Study of Manuscripts".
Dr. Ashok R. Kelkar, "Writing and Written Language".
B.S. Naik, "Early Printing in Indian Scripts".
Ramesh Sanzgiri, "Tomorrow's Master Printer".
R.N. Goswami, "Typography in Assam".
Lipikar L.S. Wakankar, "Writing in India - Ignorance and Reality".
M.G. Railkar, "Use of Computer in Library Documentation".
Dr. P.P. Apte and Dr. S.G. Supekar, "Paleo-Calligraphical Significance of the Tantric Code of Alphabets".
Dr. S.M. Ayachit, "Calligraphy and India".
Prof. Siddharth Y. Wakankar, "Manuscript Writer and His Tools".
D.T. Padekar, "Aksharatil Saundarya".
Mahendra Patel, "Letters for Tomorrow".
Dr. Ashok R. Kelkar, "Marathi Script & Spelling Reform Movements".
Annavarapu Venkat Ramamurthy, "Devanagari Ke Badhate Charan".
Satyanarayan Wadisherla, "Telugu Types Need a Face-Lift".
S.A. Sapre, "Marathi News Papers: Their Typographic Legibility".
Ernest Imhof, "Autologic: Types for the World".
M.W. Gokhale and L.S. Wakankar, "Simhalese & Thai Script".
Lipikar L.S. Wakankar, "ITR Approach for Keyboard Layouts of Indian Scripts".
S. Radhakrishnan, "Composing in Telugu News Papers".
Dr. S.J. Mangalam, "Evolution of Malayalam Script".
V.R. Oturkar, "My Experiences".
Arvind M. Patel, "Type-Design - Typographic and Photographic, the Calligraphic influence".
Dr. V. Raghavan, "Towards a Common Script".
Mukund Gokhale, "Design Parameters of Devanagari".
Agastya, "Tamil Script".
K. Bhanumurti, "Oriya Script".
Kamal Shedge, "Need of Variety of Type-Faces in Indian Regional Scripts".
D.R. Kumthekar, "The Case of Justified Vs. Unjustified Text in Indian Scripts".
Dr. S.V. Sohoni, "The Two 'W's".
V.B. Bhat, "Phonetic Braille - A New Approach".
Gopalkrishna D. Modi, "Gujarati Script & Structure of Types - in Comparison with Devanagari Script".
Dr. Lachman M. Khubchandani, "Arabic Script for Non-Semitic Languages".
Ninad Mate, "Some Suggestions by the User of Comp/Set Phototypesetter For Modifications in Existing Devanagari Font and Keyboard".

Journals & Magazines

The **Association of Asian Studies Newsletter** has a new column entitled Asian Scripts and Microcomputers. The first article, by Donald Wyatt (in Vol. 31, number 1, October, 1985), described the merits of using the Apple Macintosh computer for working with Asian scripts. The next column (appearing in Vol. 31, issue 2, December, 1985) consisted of two letters, both describing the EgWord Japanese word processor and the EgBridge product for the Apple Macintosh.

The contents of the most recent issues of **Computer Processing of Chinese & Oriental Languages**, a journal published by the Chinese Language Computer Society are listed below. Subscriptions are available from: Daniel Chang, CLCS Membership Chairman, D51/C404, IBM Corp., 555 Bailey Road, San Jose, CA 95150.

Contents of **Volume 2, issue 2**:

Jeane Shu-Chun Chen, Data compression for Chinese/Kanji characters using a scaling algorithm, pp. 71-88.

Joachim Heinzl, Guo Jun Ji, and Shuying Zhang, Decentralized terminal for input/output in Hanyupinyin, pp. 89-100.

Wen-Hsing Hsu and Fang-Hsuan Cheng, Recognition of handwritten Chinese characters by structure analysis of strokes, pp. 101-112.

Yu-hua Gu, Jia-Ruo Wan, and Kai Wang, Pre-windowed LPC vocoder and covariance LPC vocoder for synthesizing speech, pp. 113-126.

Yiuping Jiang, Chinese parsing: an initial exploration at LRC, pp. 127-138.

Contents of **Volume 2, issue 3**:

J .Zhou and S. K. Chang, A methodology for deterministic Chinese parsing, pp. 139-161.

B. Q. Feng, R. A. Tang, J. T. Yao, and Y. Qi, Computerized compilation of dictionaries, pp. 162-168.

N. Chuei, T. Y. Zhang, and C. Y. Suen, New algorithms for thinning binary images and Chinese characters, pp. 169-179.

Dvorak Developments is a quarterly newsletter on developments with the Dvorak keyboard arrangement, a more efficient method of arranging keys than the current "qwerty" standard. Computer hardware and software, as well as typewriters, that support the Dvorak arrangement are described and reviewed. Little or no attention is given to non-English keyboards, although the principle behind the Dvorak keyboard could certainly be applied to them. Subscriptions are $12 in North America and $16 in the rest of the world. For more information, write to: Freelance Communications, PO Box 1895, Upland, CA 91785.

The publications of the Association for Literary and Linguistic Computing have been combined into a new journal, **Literary and Linguistic Computing**, which is being published by Oxford University Press. The subscription rate in the U.K.is £24 for institutions and £12 for individuals; in North America, it is US$45 for institutions and US$22.50 for individuals; and in the rest of the world, it is £28 for institutions and £14 for individuals. For subscriptions and additional information, contact the Journals' Subscription Department, Oxford University Press, Walton Street, Oxford OX2 6DP, U.K..

There are many new magazines coming out on the latest trend in using computers: desktop publishing. One new magazine on this topic is **Publish!** (or perish?), a bimonthly published by PCW Communications, Inc., who also publish MacWorld and PC World. The subscription rate is $29.95 a year, although they are offering initial rates of $19.95 a year. These rates are for the USA only, with higher rates for other countries. There will probably be few articles of direct

interest, but the topic certainly is interesting and is something to be aware of. To subscribe, write to Publish!, Subscription Department, PO Box 51966, Boulder, CO 80321-1966. For lower rates, look for ads about it in MacWorld and PC World.

Text in Computers is a new journal recently begun by Proper Publishing. It is a quarterly covering all aspects of text in computers, including text input, processing of text characters and strings, and text output. Regular features will include research papers, reviews of products, and notes on algorithms, as well as others. There will be little of direct interest to the readers of this newsletter, but it will address issues of concern to anyone working with text in general. Subscriptions are $25 in the U.S., Canada, and Mexico, and $50 elsewhere. Payment should be in U.S. dollars. For more information, contact: Proper Publishing, 2000 Center St., Suite 1024, Berkeley, CA 94704; telephone: 415/644-0433.

Unix Review published a special issue on *International Unix* in December 1985. There were four articles of some interest, on the technical and marketing issues involved in making the Unix operating system work with other (i.e. non-ASCII) character sets. The articles are:

Mike Banahan, *Made in the USA*, pp. 22-28.
Karen Barnes and Dan Epstein, *Changing Character*, pp. 36-42.
G. L. Lindgren, *Facing Up to Internationalization*, pp. 50-56.
An Interview with Jim Bell: Foreign Exchange, pp. 58-65. Jim Bell is a manager at Hewlett-Packard, responsible for internationalization of HP's Unix products.

Wheels for the Mind is a quarterly published by Apple Computer which describes the software developed by members of the Apple University Consortium. It is edited by Peter Olivieri, at Boston College. There are also articles about various topics, as well as reviews of hardware and software for the Macintosh. News of new fonts for many languages appear in it regularly. Subscriptions are $12 per year (in the USA, no rate for elsewhere) from: Apple Computer, Inc., Wheels for the Mind, MS 23L, PO Box 810, Cupertino, CA 95015.

Articles

Susie Andres and S. Ramani, *The Codification of Devanagari Script for Automatic Data-Processing*, **Indian Linguistics** 31(3), pp. 91-102 (July-Sept 1970). The authors developed a character set for Devanagari and a set of programs to use a plotter-type output device to write in Devanagari .

Kambiz Badie and Masamichi Shimura, *Machine Recognition of Arabic Cursive Scripts*, in **Pattern Recognition in Practice**, E. S. Gelsema and L. N. Kanal (eds.), North-Holland Publishing Company, pp. 315-324.

R. D. Bathurst, *Automatic alphabetization of Arabic words*, in **The Computer in Literary and Linguistic Research**, R. A. Wisbey (ed.), Cambridge Univ. Press, 1971, pp. 185-190.

Zion Busharia, *Computerized Lemmatization of Non-vocalized Hebrew Texts*, in **Proc. of the International Conf. on Literary and Linguistic Computing**, Zvi Malachi (ed.), ALLC, 1979, pp. 133-140.

Y. H. Chin, J. W. Jou, W. H. Peng and C. C. Yang, *An Automatic Telephone Directory Inquiry Service System*, in **Proceedings of the ACM Conference**, 1974, San Diego, pp. 231-238. The authors describe a telephone directory service system that works in Chinese.

Yaohan Chu, *Structure of a Direct-Execution High-level Chinese Programming Language Processor*, in **Proceedings of the ACM Conference**, 1974, San Diego, pp. 19-27. The author describes a complete computer system, including software, that was designed for operation and use in the Chinese language.

Vishweshar Dixit, An Intelligent Screen Editor for Kannada and Other Indian Languages, **SAIL Newsletter** 1(1), pp. 12-14 (Jan. 1986). Dr. Dixit has developed a multi-lingual, multi-font editor on the IBM PC that is capable of displaying and printing in many languages at once. The SAIL Newsletter is available from: Prof. D. K. Dutta, Box 353, Kingston, RI 02881; telephone 401/789-6893.

Peter Gordon, *An Introduction to Issues in Foreign-Language Computer Design* , in Kiril Boranov (ed.), **Networks in Office Automation**, North-Holland, Amsterdam, 1985 (ISBN 0 444 87715 0). An excellent, if brief, introduction to the problems of designing hardware (specifically keyboards) and software (especially character sets) that will work for many languages. The author works for Wang and has had to deal with these issues in designing systems.

Hideyuki Hayashi, Sheila Duncan and Susumu Kuno, *Graphical Input/Output of Nonstandard Characters*, **Communications of the ACM** 11(9), pp. 613-618. An early system for the input and output of Chinese characters.

Alan Jones, *Some Oxford projects in oriental languages*, in **The Computer in Literary and Linguistic Research**, R. A. Wisbey (ed.), Cambridge Univ. Press, 1971, pp. 191-197.

Pierre McKay, *Typesetting Problem Scripts*, **Byte** (Feb 1986), pp. 201-218. An article describing how the TEX system can work with Arabic and related scripts.

Willard McCarthy, *Review of T3, A Multilingual Word Processing Package for the IBM PC*, **Computers and the Humanities** 20(1), pp. 57–62.

Willard McCarthy, *Review of Nota Bene, an Academic Word Processing and Text Retrieval System for the IBM PC*, **Computers and the Humanities** 20(1), pp. 62–71.

Tung Yun Mei, LCCD, *A Language for Chinese Character Design*, **Software – Practice and Experience** 11, pp. 1273-1292 (1981). The author explains a compiler of Chinese characters. Many of the ideas in this system are extensions of Donald Knuth's TEX system.

Makato Nagao, *Data Compression of Chinese Character Patterns*, **Proceedings of the IEEE** 68(7), pp. 818-829 (July 1980). The article examines various methods of reducing the amount of storage required for Chinese character patterns. A 41 item bibliography is included.

Peter Nancarrow, *A System for Processing Tibetan Texts in their Original Orthography* , **Journal of the ALLC** 1(1), pp. 19-24.

Uzzi Ornan, *Computing Hebrew "Pointed" Writing*, in **Proc. of the International Conf. on Literary and Linguistic Computing**, Zvi Malachi (ed.), ALLC, 1979, pp. 329-335.

William Raike, *Favoring Kanji*, **Byte** (Jan. 1986), pp. 381-385. A brief review of several Japanese word processors and computers, as well as the EgWord Japanese word processor for the Macintosh and the EgBridge program which permits the use of Japanese characters (in all 4 scripts) in *any* Macintosh application. Mr. Raike writes a monthly column in Byte about what is happening in the Japanese computer industry.

Raymond Rogers, *Pinyin for the PC*, **PC World** (June 1984), pp. 285-289. A brief article on the Hanyupinyin Chinese word processor available from International Computerized Linguistics, Inc.

N. Steidtmann, *The PC in China*, **PC World** (June 1984), pp. 274-279. A brief look at the current state of the microcomputer in China.

Maurice Valois, *Terminal Compatibility*, **Data Base Monthly** (Jan. 1986) pp. 26-30. This is a brief article by a Data General software manager about the special modifications to terminals that DG has done, including non-Western scripts. A non-technical article in a monthly magazine devoted to Data General computers.

Richard Willis, *Big Blue goes Japanese*, **Byte** (Nov. 1983), pp.144-164. A fairly detailed look at the IBM PC model 5550, the Japanese version of the PC. The article also reviews Japanese scripts and keyboards.

Product Listings

In this section, we report on hardware and software products that are of some interest to readers of this newsletter. Note that nothing is actually reviewed here. All information has been supplied by the vendor or has been reported in trade journals.

If you have used a product, hardware, software or a service that might be of interest to other readers, please write a review of it — even a paragraph. Send to the editor at the address on the inside front cover.

Hardware Products

China United Trading Company: Great Wall Chinese Language IBM PC Compatibles

Description: A series of Chinese/English language IBM PC compatible computers.

A family of IBM PC compatible computers manufactured in China are available. Some of the models are the GW0520A, an IBM PC/XT compatible with a 10 Mb hard disk, the GW0520CH, an IBM PC/XT compatible with a 20 Mb hard disk, and an IBM PC/AT compatible (model number unknown). Several versions of DOS are available, including English only. Chinese language processing is supported with the GWBIOS, which supports Chinese characters in word processing and application programs. Both color and monochrome monitors are supported.

Chinese characters are available in two sizes: 16 by 16 matrices and 24 by 28 matrices. About 7000 Chinese characters in the Foung-Sung style are stored in ROMs on the display adapter boards. Up to 64 (or 128, depending on the model) additional characters can be created by a user.

Contact (in the USA): China United Trading Corporation, Ltd., 250 West 34th Street, New York, NY 10119; telephone: 212/947-3140.

Contact (in China): Computer Business Division, CEIEC, PO Box 140, Beijing, China.

Computers Anywhere Inc.: Interword Word Processing Program

Description: Word processor/chip system for multilingual word processing.

Computers Anywhere has developed a set of EPROM chips for working with Arabic and English on an IBM PC. The chip means that no additional software is required (although it also means that if more than one person needs Arabic, more than one copy of the EPROM is needed). Contextual analysis is performed to select the appropriate form of each character. A Russian/English chip is also available. The company plans to have similar chips for Chinese, Japanese and Hindi.

Contact: Computers Anywhere Inc., 8200 Greensboro Drive, Suite 304, McLean, VA 22102; telephone: 703/442-7910.

Comterm Inc.: Arabic/English and Farsi/English Computer Systems

Description: Computer systems and software for bilingual (Arabic/English or Farsi/English) word processing.

Comterm has developed several computer systems that allow users to work in Arabic and English or in Farsi and English. Also available are bilingual terminals and printers. They can be controlled from standard computers because Comterm provides technical documentation on how they operate. Contextual analysis is performed automatically to decide which form is appropriate for Arabic and Farsi characters.

Contact: Comterm Inc., 545 Delmar Avenue, Pointe Claire, Quebec, Canada H9R 4A7; telephone: (514)694-3030.

Hooleon Corporation: Keyboard Overlays

Description: Keyboard overlays for IBM PC (and other computers') keyboards for Arabic and other languages.

Hooleon Corporation manufactures various keybaord modification kits, including custom and off-the-shelf key overlays, key template cards, and other related products. The key overlays are printed on the underside to prevent wear. Some kits are printed on transparent plastic, so the original key legends are still readable. A kit for Arabic is available for IBM PC keyboards. Other kits that may be available soon are: Farsi, Korean, Vietnamese, and Cambodian. Custom overlays can also be manufactured. Other off-the-shelf kits are available for Dvorak keyboards (for a variety of machines), various European languages (for the IBM PC) and braille (for the IBM PC). Kits range in price from about $19 to $30.

Contact: Hooleon Corporation, Page Spring Road, PO Box 201, Cornville, AZ 86325; telephone: 602/634-7517.

Intech Systems, Inc.: CP2054 Chinese Word Processor

Description: A touch-screen based Chinese word processing system.

Intech Systems has developed a touch-screen based system for Chinese word processing. The system can produce Chinese in either vertical or left to right formats. The user can choose from four phonetic systems: pinyin, CNPA (Taiwan), Wade-Giles and Yale. The user can also choose between traditional and simplified character sets. Characters are entered by first touching the roman character which corresponds to the first phoneme. The system then generates a second menu of all the Chinese characters which begin with that sound. The user than selects the character that is a homonym of the character desired. The system then displays all the characters that have that pronunciation and the user can select the appropriate one. The system sells for about $3500 in the US. Additional software includes an abacus (with special provisions for multiplication and division) and a Western style calculator. A twenty four pin dot matrix printer is also available. This product was mentioned in two articles: "Intech Computer System Designed to Generate Chinese Characters," *Computer Retail News*, 10 Feb 1986, p. 70. and "Chinese words at a touch," *IEEE Spectrum*, April 1986, p. 79.

Contact: Intech Systems, Inc., 6901 West 110th Street, Minneapolis, MN 55438.

Software Products and Services

Alis-Soft, Inc.: A-Word Arabic and Farsi Word Processing Programs

Description: Arabic and Farsi word processing programs for the IBM PC and compatibles.

Alis-Soft has modified Lexisoft's Spellbinder word processing program to work with Arabic and Farsi. The A-Word program works on IBM PCs and most compatibles. Both versions are bilingual: Arabic/English or Farsi/English.

Contact: Alis-Soft, Inc., 901 Tennessee Street, San Francisco, CA 94107; telephone: 415/285-4891.

Altsys Corporation: Fontographer

Description: A Postscript-font designing program for the Macintosh.

Altsys has released their Postscript font designing program, Fontographer. This program allows anyone to design fonts that can be used by Apple's LaserWriter, or any other Postscript output device (including for example, the Linotronic 100 and 300 phototypesetters). Fonts are designed character by character by drawing curves and lines. A bitmap (screen) font can be produced automatically from the Postscript description of the font. A copy of Fontastic, a bitmap font designing program, is included because the automatically designed bitmaps usually require a little cleaning up. The latest versions of the Macintosh operating system can automatically download Postscript fonts to the LaserWriter when they're used.

The retail price is $395. Their other product is Fontastic, a screen font designing program for the Macintosh which retails for $49.95.

Contact: Altsys Corporation, PO Box 865410, Plano, TX 75086; telephone: 214/596-4970.

Asiagraphics Corporation: ZLZ Word Processing Program and CZ Module

Description: A series of word processing and utility programs for the IBM PC and compatibles.

Asiagraphics has released a new generation of their CJK (Chinese, Japanese, and Korean) word processing systems, the ZLZ Word Processing program. The programs will work on any model of the IBM PC/XT/AT family, including many compatibles. All the programs use an easy-to-learn, easy-to-use phonetic input method that requires minimal operator training. Both simplified and traditional Chinese character sets are available in the same program. In addition, roman characters can be used in the same line. Two character sizes are available for printing.

Their input method, called DESCRIPTOR, requires 3 to 4 strokes per character. The user enters the pin-yin or Wade-Giles romanization of the character, then the tone, the radical family indicator (i.e., which of the 52 radical families), and lastly, the spacebar.

A Hercules monochrome graphics adapter board (or compatible) is required.

The CZ Module is a program which allows users to enter Chinese characters into virtually any IBM PC program, including Lotus 1-2-3 and dBase III. The user enters Chinese characters into the program using the DESCRIPTOR method (described above) and creates a disk file in the

application. This file is then run through the CZ Module, which converts the descriptors into Chinese characters and either displays the file on the screen or prints it out.

The word processing program is available for $395 (there are three different versions – Chinese, Japanese, and Korean). The CZ Module is available for $295.

Contact: Asiagraphics Corporation, 407 East Main Street, PO Box 153, Port Jefferson, NY 11777; telephone: 516/473-8881.

Avenue Software: MacKeymeleon

Description: A keyboard customization program for the Macintosh.

MacKeymeleon is a utility program that let's you define which key produces what code. This means that the standard keyboard can be redefined to act like a Dvorak keyboard, or a DEC VT-100 family keyboard, or a Hindi or Tamil keyboard. After a new keyboard definition is completed, it can be installed as a desk accessory that can be accessed from inside any Macintosh application. Any number of 'dead' keys can be defined, as well as diacritics. This product along with Altsys Corp's Fontastic can be used together to easily produce fonts and reasonable keyboards for most languages.

The retail price is US$49.95.

Contact: Avenue Software, C.P. 2085, Terminus (Québec), Québec, Canada G1K 7M9; telephone: 418/641-0441.

Davka Corporation: Hebrew Language Software

Description: Hebrew language software for the Apple II, Macintosh, IBM PC, and other machines.

Davka has developed many programs for Hebrew or Hebrew and English on several machines. Briefly, they are:

Name	Machines	Notes
Alef-Bet Computer Coloring Book	Apple II	
Learning to Read Hebrew	Apple II, Commodore 64, Atari	
Ulpan Davka	Apple II	Hebrew flashcards
Write Hebrew	Apple II	
Dynamic Hebrew Dictionary	Apple II	
The Hebrew Phrasebook	Apple II	
Chumash Compu-Flash Cards	Apple II, Atari	
Compu-Dikduk	Apple II, Atari	Hebrew grammar
Divide and Conquer	Apple II	Hebrew word formation
Hebrew Writer	Apple II	Hebrew text editor
Screen Writer II	Apple II	Hebrew word processor
Hebrew Super-Pilot	Apple II	Lesson authoring language
Creative Hebrew Quizzer	Apple II	
Hebrew/English Banner Maker	Apple II	
Hebrew Appleworks	Apple II	Hebrew version of Appleworks
Mousewrite	Macintosh	Bilingual word processor
Mince	IBM PC	Bilingual word processor

Anyone working in Hebrew will probably find something of interest from Davka.

Contact: Davka Corporation, 845 N. Michigan Avenue, Suite 843, Chicago, IL 60611; telephone: 800/621-8227, in Illinois: 312/944-4070.

Duke University: The Duke Chinese Typist

Description: A basic Chinese word processing program for the IBM PC and compatible family of computers.

The Duke Chinese Typist is a basic Chinese word processing program designed especially for ease of input by American students and teachers of Chinese, using a standard IBM or compatible computer. Chinese characters in either simple or complex style, English, or pinyin with tonal diacritics may be typed phonetically in running text and then dispalyed automatically in the appropriate font. As a language-learning tool, it improves character recognition while it encourages creative composition. For the Chinese teacher, it provides a means of producing and revising teaching materials.

Hardware requirements are an IBM PC, XT, AT, or compatible microcomputer with 512K RAM, an IBM Enhanced Graphics Adapter (EGA) card (or compatible), and a monochrome (not a composite) or enhanced color monitor. A hard disk is not required, but is recommended. Printers supported are the IBM ProPrinter, the Epson FX series, the IBM Quietwriter Model 2, and the Hewlett-Packard LaserJet.

Version 1.0 of the Duke Chinese Typist is available for experimental use by institutions and individuals for $25 (to cover materials, postage and handling). Users will receive 2 floppy disks containing the program with a brief user's guide. Users will also be registered to receive future enhancements. Institutions may make copies as needed for each student or workstation. Send orders to Prof. Richard Kunst, with checks payable to Duke University.

Contact: Prof. Richard Kunst, Asian/Pacific Studies Institute, 2111 Campus Drive, Duke University, Durham, NC 27706; telephone 919/684-2604.

Ecological Linguistics: Font/Keyboard Definition Packages for the Macintosh

Description: Packages of fonts and keyboards for different languages on the Macintosh.

Ecological Linguistics has combined Macintosh screen fonts with keyboard layouts for many languages. By offering them in combination like this, editing in other languages is easier and more efficient. Packages are available for most of the Indian and South-East Asian languages, as well as for several European languages. The cost is $15 for the first package and $10 per package after that.

Contact: Ecological Linguistics, PO Box 15156, Washington, D.C. 20003-0156.

Gamma Productions, Inc.: Scribe Multilingual Word Processor

Description: A multi-lingual word processing program for the IBM PC and compatibles.

Gamma Productions has released Scribe, their multilingual word processor for the IBM PC and compatibles. The program supports the simultaneous use of English, Hebrew, Greek, Arabic, Russian, and most European languages. Hebrew and Arabic are written from right to left. Several

customers have developed support for Punjabi, Thai, and Japanese. Full word processing features are available, including: headers and footers, search, replace, strike-through, multiple columns, boldface, and so on.

A Font Generation program provides the ability to add new characters (in any language), as well as the ability to modify the keyboard layout.

Scribe supports IBM and Hercules color adapters, and the Hercules monochrome adapter. Printers supported include: Epson, IBM Graphics and ProPrinter, Okidata with Plug 'n Play, C. Itoh Prowriter, and the NEC 8023A. The cost is $184 for Scribe, $75 for 24-pin printer and laser printer support, and $100 for the font generator program.

Contact: Gamma Productions, Inc., 817 10th Street, Suite 102, Santa Monica, CA 90403; telephone: 213/451-9507.

Intex Software Systems Int'l, Inc.: Intext Multilingual Word Processor

Description: A multi-lingual word processing programs for the IBM PC and compatibles.

Intex Software Systems has released Intex, their multilingual word processor for the IBM PC and compatibles. The program supports the simultaneous use of two languages at a time. They claim support for 41 languages, including Hindi, Russian, Urdu, Hebrew, Arabic, and Farsi. It can use a variety of printers, including dot-matrix, 'letter-quality,' and laser printers. The keyboard is automatically reconfigured when the user switches languages.

Intex costs $495 for a two language version.

Contact: Intex Software Systems International, Inc., New York, NY; telephone: 212/750-1140.

JHL Research, Inc.: China Star family products

Description: China Star family of Chinese word processing systems for the IBM PC and compatibles.

China Star has a family of products for word processing and programming using IBM PCs or compatibles. Each supports several of the following input methods: pinyin, chu-yin, 'English input method,' and the 'Chinese alphabetical method.' All programs are multilingual, and support languages such as English, Greek, and Russian. A conversion program is provided with each to automatically convert traditional characters to simplified and vice versa.

The *China Star II* program can display up to 480 Chinese characters per screen (12 lines by 40 characters). Characters are displayed in a 16 by 16 matrix. There are 21,000 traditional amd 11,000 simplified characters available.

The *Advanced China Star II* program displays 1000 characters per screen (25 lines by 40 characters) in a 16 by 16 matrix. There are 21,000 traditional and 11,000 simplified characters available. Many existing IBM PC applications can be used in Chinese, such as dBase III, MathPlan, etc. Programming languages such as C, PASCAL, Fortran, etc. can be used to develop multilingual application programs.

The *Professional China Star II* product includes a 24 by 24 matrix Chinese interface card that requires a monochrome monitor. A multi-purpose card (also included) serves as a parallel printer interface, monochrome monitor adapter, and Hercules compatible graphics adapter. Software included as part of the product: Chinese word processor, character generator utility program, character selector program, III-DOS - a Chinese operating system add-on to PC/MS-DOS. Chinese can be used in most existing application programs. There are 21,000 traditional and 11,000 simplified characters available, although the Chinese interface adapter is capable of

supporting up to 40,000 characters. Each Chinese character has 4 sizes: 15 by 15, 15 by 16, 24 by 22, and 24 by 24 matrices. Programming languages such as C, PASCAL, Fortran, etc. can be used to develop multilingual application programs.

The prices are: ChinaStar II – $99, Advanced China Star II – $295 to $395, and Professional China Star II, $1295. All programs work with Epson 9 or compatible printers. The Professional version can also work with the Brother DM40 and Toshiba printers.

Contact: JHL Research, Inc., 2552 West Woodland Drive, Anaheim, CA 92801; telephone: 714/827–7420.

Walter Knapp: Public Domain Fonts for the Macintosh

Description: Public domain fonts for the Macintosh.

Walter Knapp has gathered together an enormous collection of fonts for the Apple Macintosh. He now has over 15 disks of fonts. Several fonts are of interest to the readers of this newsletter, including: Arabic, diacritics, several Hebrew fonts, Ornamental Arabic and perhaps others. They can be obtained from him by sending one or more formatted Macintosh disks and a list of the fonts you would like. There are several documents about how to use and modify fonts available as well. Mr. Knapp previously distributed these fonts as the University of Washington public domain font collection.

Contact: Walter Knapp, 3908 Ferncliff Road, Snellville, GA 30278.

LinguaSoft: Translation Services

Description: Services for translating software and documentation to European and Asian languages.

LinguaSoft, a division of InterLingua/TTI Group, Ltd. of London, has opened offices in New York, Boston and San Francisco. Translation costs are based on the size of the program and manual, averaging about $70 per hour. The company also provides some assistance in finding distributors in various countries.

Linguists' Software: Macintosh Fonts

Description: Macintosh fonts for Hebrew, Korean, IPA phonetics, Japanese, Cyrillic, Greek, Diacritics, French, German, Spanish, Technical (& Mathematical) Symbols

Fonts for the following languages are available from Linguists' Software. Each package includes versions of the font in several sizes, usually including the 9, 10, 12, 14, 18, 20, and 24 point sizes. Font packages available are:

Hebrew – right-to-left desk accessory included, includes all accents, diacritical marks, etc.
Korean – with 3 font families (Seoul, Puson, and Inchon)
IPA phonetics
Japanese – including hirigana, katakana, punctuation marks, and 70 kanji characters
MacKanji – includes 800 kanji characters (radical based)
MacCyrillic
SuperGreek – includes all accents, diacritical marks, etc.
MacTransliterator – including 50 diacritical marks
European languages – for French, German, and Spanish

Tech – technical and mathematical symbols useful for equations, etc.
Each package costs $99.95, and includes a manual and keyboard layout sheet.

Contact: Linguists' Software, 137 Linden Street, South Hamilton, MA 01982; telephone: 617/468–3037.

Mahayana Sutra and Tantra Press: Tibetan Text Processing System

Description: A Tibetan text processing system for IBM PCs and compatibles.

The TTPS (Tibetan Text Processing System) was developed to produce bi-lingual (Tibetan/English) publications of the Mahayana Sutra and Tantra Press. It is now available for general use.

The package includes all characters in the standard Tibetan alphabet, with all standard double- and triple-stacked letter combinations. The characters are modeled after the U-chen style of calligraphy. A subset of special Sanskrit characters represented in the Tibetan script is included (a full set is under development and will be available as an update). Also included is a set of roman and italic fonts, including diacritic marks needed for representing Sanskrit, that can be intermixed with Tibetan.

Text is created using a text editor or word processor (not included in the package). Formatting commands are also entered into this file. Commands include: setting of margins, automatic word-wrap, justification, and so on. The file is then run through the TTPS program, which formats the text and prints it out. The following printers are supported (note that not all printers support the full capabilities of the package): Toshiba (P-1340, P-1350, P-1351, P-341, and P-351) and Dataproducts 8000-series (formerly known as the IDS Prism 80 and 132 printers).

Future enhancements will include the ability to display Tibetan on the screen, draft mode printing, and Tibetan keycaps.

TTPS costs $30 and includes a 50 page manual. Shipping and handling is $4 in the USA, $5 in Canada, and $15 elsewhere. The package is sent via first class mail to addresses in North America, and via air mail elsewhere.

Contact: Mahayana Sutra and Tantra Press, 216A West Second Street, Howell, NJ 07731.

Megachomp Company: DuangJan Bilingual Word Processor

Description: DuangJan - a series of bilingual word processing programs for the IBM PC.

Megachomp has developed a series of bilingual word processing programs for the IBM PC series of microcomputers. They are now shipping DuangJan version 1.20. Included with the system are several utility programs, including a font designing program, a keyboard layout editor and a typing tutor program (English language only). Both languages can be displayed simultaneously. Printers currently supported are the Epson, C. Itoh, and IBM families of dot matrix printers [Specific model numbers are unknown to the editor]. Support for the Epson LQ 800 and 1000 will be available soon. The program is not copy protected. Versions are available for English and the following languages: Latin (including French, German, Portugese, Spanish, etc.), Greek, Lao, Russian, Thai, Vietnamese, and Cambodian. Each version costs $59 plus $4 shipping in North America. Elsewhere, add $10.

Contact: Megachomp Company, 3524 Cottman Ave., Philadelphia, PA 19149-1606; telephone 215/331-2748.

ProSoft: Fontasy Graphics

Description: Fonts and graphics program for IBM PC.

ProSoft offers a graphics program and many disks of fonts for the IBM PC. One disk of fonts includes four Hebrew fonts, as well as several European fonts (Russian, Greek and a font of various diacritics). The software needs an IBM CGA graphics board or a Hercules monochrome board. It supports many popular dot matrix printers and several laser printers (HP LaserJet and ThinkJet). The system was selling for $49.95 early in 1986, but may have increased in price. Font disks cost $29.95.

Contact: ProSoft, 7248 Bellaire Ave., Box 560, North Hollywood, CA 91603; telephone: (818)765–4444.

Pierre Robillard: Tibetan Font for the Macintosh

Description: A set of screen fonts for Tibetan on the Macintosh.

Mr. Robillard has designed a Tibetan font in several sizes for use on the Macintosh. The font does not include the Tibetanized-Sanskrit characters needed for some texts, but they will be available in the future. The fonts were designed to be used with a photocopying machine, in order to produce high-quality output. A detailed description of how to use the font and a keyboard map is included. He is making them available for $10 and a pre-formatted disk.

Contact: Pierre Robillard, 200 Balsam Avenue, Toronto, Ontario, Canada M4E 3C3; telephone: 416/699-5718.

Sensei Software Company: EgWord and EgBridge – Japanese on the Mac

Description: EgWord, a Japanese word processing program for the Macintosh, and EgBridge, a desk accessory that allows the use of Japanese in existing Macintosh applications.

Sensei Software is a cooperative effort between Counterpoint Systems Company of Cambridge, Massachusetts and Ergonomics Software Products International, Ltd. of Tokyo, the Japanese software company which developed EgWord and EgBridge. Japanese is entered by typing the romanji or kana characters and then clicking the mouse for conversion to kanji. Whole phrases or sentences can be converted in this manner.

EgWord is a full-featured Japanese word processing program that includes the JIS-1 kanji character set and a 35,000 word hirigana-to-kanji translation dictionary. Up to five text and graphics windows can be open at a time. A "soft keyboard" gives full access to the entire kanji, kana, and romanji character sets. A font utility is provided for the creation of new symbols, characters, and marks in a 24 by 24 matrix. Additional kana-to-kanji dictionary entries can be added to a glossary. Both the font utility and glossary are available inside EgWord.

EgBridge is a desk accessory that allows the use of Japanese with existing Macintosh applications. It uses the same character set and dictionary as EgWord. Applications currently supported are Apple's MacPaint, MacProject, and MacDraw, and Microsoft's Multiplan, Chart, File, and Excel. Additional software will be supported in the future. Also included is the *Nihongo Notepad* desk accessory, which allows the direct entry of Japanese. Text in this notepad can then be copied and pasted into existing applications.

Prices are $299 for EgWord and $179 for EgBridge. Academic and volume discounts are available.

Contact (in the USA): Sensei Software Company, c/o Counterpoint Systems, PO Box 1685, Cambridge, MA 02238; telephone: 617/576-6639 or 617/495-4921. [**Last minute note**: Apparently Sensei Software is no longer the US distributor for the product. Until the new distributor is appointed, you can contact Bill Sullivan for information. He can be reached at 415/427-0676, or you can write to him at PO Box 271, Stinson Beach, CA 94970.]

Contact (in Japan): Ergonomics Software Products International, Ltd., Taneda Building 5F, 1-2-5 Moto-Akasaka, Minato-ku, Tokyo, Japan; telephone: 03-478-2234.

James Slater: MacArabic

Description: A desk accessory and a set of fonts for Arabic on the Macintosh.

Mr. Slater has developed a desk accessory for the Macintosh which makes Arabic and other right-to-left scripts easy to use on the Macintosh. The desk accessory can be used in MacWrite or Microsoft Word. The keyboard resembles that of an Arabic typewriter. The Arabic font in 12 and 24 point sizes includes accents and diacritic marks. MacArabic costs $99.95, and includes a manual and laminated keybaord layout sheet.

Contact: James Slater, 6207 Olentangy River Rd., Worthington, OH 43085; telephone: 614/846-7279.

Dr. C. Y. Suen: Computer tape of digitized Chinese characters

Description: A magnetic tape containing 4864 digitized Chinese characters is available from Dr. Suen.

A 9-track, 1600 bpi magnetic tape containing the corpus, data and digitized images of Chinese characters is available. The 4864 characters are described as 50 by 50 matrices. The tape also contains statistics relating to the characters (relative frequency, etc.) and a FORTRAN program which extracts the character matrices. Dr. Suen has also written a book, *Computational Studies of the Most Frequent Chinese Words and Sounds* , which is described in the bibliography section in this Newsletter. The tape is available for US$325; for airmail delivery, add $20.

Contact: Dr. C. Y. Suen, Dept. of Computer Science, Concordia University, 1455 de Maisonneuve West, Montreal, Quebec H3G 1M8, Canada.

Unisource Software Corp.: Feima Chinese Word Processing Program

Description: A Chinese word processing program for the Macintosh.

Unisource Software is now distributing the Feima Chinese language word processing program for the Macintosh. The program was developed (and originally distributed) by Gene Wu, of Wu Corporation. Six input methods are supported. A utility is also available for conversion of simplified characters to traditional characters and vice versa. [Editor's note: little else is known about it at this time. We hope to have more details in the next issue.]

Contact: Unisource Software Corp., 71 Bent Street, Cambridge, MA 02141; telephone: 617/577-8383.

University of Arizona: Icon Programming Language

Description: Source code for and newsletters on the Icon programming language.

The University of Arizona makes available the source code for the Icon programming language. Icon is the successor to the SNOBOL family of languages, and has been developed under the direction of Dr. Ralph Griswold. Although the language is useful only on larger machines (mini-computers and larger), there are implementations for the IBM PC (the current version uses the small memory model) and (soon) the Macintosh, although the initial implementation will work only under the MPW (Macintosh Programmer's Workshop, Apple's native development system for the Macintosh). A nominal fee is charged for the source code if a magnetic tape is not provided. A irregularly published newsletter on Icon is also available.

The Icon language should be of interest to anyone doing linguistic or literary analysis in any language. It enables rather small programs to be written to accomplish tasks that might be much more difficult in other programming languages.

Contact: Icon Project, Department of Computer Science, The University of Arizona, Tucson, AZ 85721.

University of Arizona: SNOBOL Programming Language

Description: Source code for and newsletters on the SNOBOL programming language.

The University of Arizona makes available the source code for several implementations of the SNOBOL programming language. SNOBOL has been around for many years now, and is undergoing something of a renaissance now that versions are available for the IBM PC (although none of them are distributed by the University of Arizona). There is no version of SNOBOL available for the Macintosh at this time; all the versions available from the University are for larger machines. SNOBOL has been superceded in many respects by the Icon language (see above) but SNOBOL is still a quite useful language. An irregularly published newsletter is available from the University, as well as a list of all known implementations.

Contact:: SNOBOL Project, Department of Computer Science, The University of Arizona, Tucson, AZ 85721.

Queries

To have your query listed here, send it to the Editor at the address given on the inside front cover.

I need a **spell-checker** for my **IBM PC-AT which reads IBM high-ASCII special characters** (hex 128-255), as well as normal characters. It must permit me to add a large user dictionary for Moore, a West African language which uses several of the Greek characters and vowels with diacritical marks which are in the IBM high-ASCII character set. Most spell checkers cannot handle these characters (I've looked into SpellStar, Microsoft Spell, the Aspen/Random House Proofreader, The Word Plus, PFS-spell, Houghton-Mifflin Spelling Verifier, IBM's spell checker, and MicroSpell, among others - none work.) I also need a French dictionary on disk. Please contact Alan Fiske at the Psychology Department, University of Pennsylvania, 3815 Walnut St., Philadelphia, PA 19104-6196, or telephone at 215/898-3510.

Events

To have your event listed, send a description of it to the Editor, Newsletter for Asian and Middle Eastern Languages, Bear River Systems, PO Box 1021, Berkeley, CA 94701.

Aug. 20-22, 1986 - 1986 International Conference on Chinese Computing.
The conference will be held at the National University of Singapore. Tutorials on computer processing of Chinese will be held on August 20. The exhibit hall will be open from August 20 through 22. The opening address will be given by the Minister of Education, Dr. Tony Tan. Advance registration is US$105 for members and US$120 for non-members. At the door, registration is US$120 for members and US$135 for non-members. The tutorials must be paid for as well. For more information, contact: Dr. K. T. Lua, Dept. of Information Systems and Computer Science, National University of Singapore, Lower Kent Ridge, Singapore 0511.

Oct. 9-11, 1986 – ICEBOL: The International Conference on Applications of SNOBOL and SPITBOL.
The conference will be held in Madison, South Dakota. The keynote speaker will be Susan Hockey, Oxford University. Featured speakers will be Ralph Griswold (the 'father' of SNOBOL), University of Arizona, and James Gimpel, Lehigh University. An advanced SNOBOL programming clinic will be conducted by Ralph Griswold. Registration is $105 if received before Sept. 25 and $135 afterwards. Proceedings will be available for $18. For more information, write to: Eric Johnson, ICEBOL Director, 114 Beadle Hall, Dakota State College, Madison, SD 57042; telephone: 605/256-5270.

July 3-6, 1987 - International Conference on Thai Studies.
The conference will be held at the Australian National University in Canberra, Australia. There will be ten sections on various topics and a special session on *Microcomputers and Asian Scripts*. This session is being organized by Prof. David Wyatt, Dept. of History, Cornell University, Ithaca, NY 14853. The registration fee will be A$50. For more information about the conference, contact: International Conference on Thai Studies, 1987, the Australian National University, Box 4, GPO, Canberra, ACT 2601, Australia; telephone: [062]493273 or 492162.

Gossip

In this section, we will tell bits and pieces of miscellaneous information and news that don't fit in elsewhere. The source of each note will be given, if known. Most of this will come from the trade press (which has been known to make errors) so do take anything in this section with a grain of salt.

Apple Computer Japan has released a **Japanese version of the Macintosh**. See the article in this issue for more details about it. Apple Japan has been trying to encourage Japanese software companies to develop more software for the Mac. Apple has also recently signed some agreements in mainland China to sell Macintoshes and to encourage the development of **Chinese software for the Macintosh**. (From "Apple Japan hopes to cash in on native-language WP", **Computer+Software News**, 30 Sept 1985, pg. 19.)

AT&T is working on a **Japanese** version of the popular **Unix** operating system. Much of the work is apparently being done by the Berkeley Unix house, UniSoft Corporation. Among other things, a multiple byte per character representation is being developed and implemented. This will make Japanese, Chinese and Korean versions of Unix much easier on developers. (From "AT&T Hedges on Release 3 of Unix V, But Demonstrates RFS, Other Features", **Electronic Engineering Times**, 10 Feb 1986, pg. 18)

Fortune Systems has signed an agreement with the Kirloskar Group of India. The agreement will establish a software development facility in India, as well as transfer hardware and software manufacturing facilities to India. Fortune develops small (1 to 4 user) Unix systems. (From "Fortune eyes India's market to offset problems at home", **Computer+Software News**, 15 July 1985, pg. 16)

Lotus has signed an agreement with Kanri Kogaki Kenkyusho Ltd. (K3 Ltd.) of Japan to develop Japanese language versions of their products. K3 will work with Lotus Japan in this process. (From "Lotus Development intensifies its overseas efforts", **Computer+Software News**, 15 July 1985, pg. 44)